were no remarkable fluctuations in blood pressure, pulse, respiration, or temperature and, except for a fleeting pyrosis on two occasions, the patient stated that he felt perfectly comfortable. No depression of the heart [6] was observed.

THYMOL ON THE OIDIUM IN VITRO

In the culture of *Coccidioides immitis* no special media are required. A luxuriant growth appears on plain agar after five to seven days' incubation at 37 C. Bump [7] describes the cultural characteristics of the organism, and these need not be repeated here.

The effect of different dilutions of thymol was tried upon *Coccidioides immitis in vitro.* Plain agar cultures of the organism were exposed to dilutions of thymol in water ranging from 0.02 to 0.2 per cent for periods of from one-half to four hours. Subcultures were then made from the original tubes. No organisms which had been exposed to thymol dilutions exceeding 0.05 per cent grew in subculture, whereas heavy growths developed in all control tubes.

Thymol, therefore, appears to act effectively as an antiseptic against the organism *in vitro,* but the effective concentration could not occur in the body tissues during life without toxicity. A concentration of 0.05 per cent would be the equivalent of 30 grams (about one ounce) in the tissues of a 60 kilo (120-pound) man, and this concentration must inevitably prove fatal. Assuming complete absorption of the highest dose administered to this patient (2.5 grams), the tissue concentration of thymol would have been approximately 0.004 per cent, which is less than one-twenty-fifth of that actually required. Since not all the thymol administered was absorbed, the tissue concentration must have been much less than 0.004 per cent. This is at least one reason why the thymol did not prove effective.

Another factor entering into the treatment of the disease is the penetration of the capsule surrounding the organism in human or animal tissue. Judging from the failure of thymol applied locally to improve the appearance of the lesions, even higher concentrations are unable to penetrate the capsule in spite of the lipoidal solubility of the drug. *In vitro* the capsule is absent, and the thymol does not meet with this obstacle. Large doses of iodid might assist in the breaking down of the capsule *in vivo,* and this drug should be tried in conjunction with thymol.

Unfortunately no opportunity offered itself for trying intravenous antimony and potassium tartrate as recommended by Guy[8] and by Tomlinson.[9]

PORTAL OF ENTRY OF THE INFECTION

Although the onset of the disease in this patient could not be definitely established, the infection apparently was one of long standing. There had been a lesion of the left foot for thirty years, and eight years previous to the hospital entry there was a history of chronic cough and pulmonary hemorrhage. Four years before the present time a striking change in the character and appearance of the lesions occurred. It is, therefore, impossible to conclude whether the organism found its portal of entry through the foot, or whether it was primarily a pulmonary infection. Several authorities [10 11] are inclined to the belief that the infection is always primarily pulmonary, and that the peripheral lesions are metastatic.

SUMMARY

1. A patient showing granulomata of the leg, and possible visceral lesions due to *Coccidioides immitis,* failed to respond to treatment with large doses of thymol. Local treatment of the lesions with thymol in 5 per cent strength was also ineffective, although the organisms *in vitro* were killed by concentrations exceeding 0.05 per cent.

2. A total of 22 grams of thymol was administered over a ten-day period without symptoms of toxicity.

3. The urinary excretion of the thymol varied from 17 to 92 per cent of the daily dose administered; the average daily excretion was 55 per cent. This excretion is greater than has been hitherto reported. The marked fluctuations in the daily excretion suggest considerable irregularity of absorption of thymol from the alimentary tract.

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COMPLETE OBSTRUCTION OF ESOPHAGUS DUE TO BOLUS OF FOOD*

REPORT OF CASE

By RULON S. TILLOTSON, M.D.

Woodland

F. G., age 16, walked into the San Francisco Hospital the morning of June 13, 1929, with the complaint of inability to swallow solid food or liquids since the preceding evening. At that time while eating his evening meal, which included beef stew among other things, his food seemed to stop suddenly on its way down. On continuing to eat he regurgitated each new portion taken. No pain was noted except for a little feeling of discomfort vaguely referred to the substernal region. He retired that night giving the matter little thought. On the following morning, on account of the thirst and hunger which he was unable to relieve, in addition to the fact that he felt

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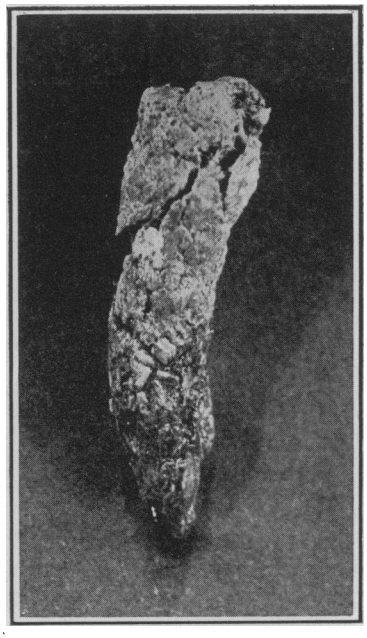

Fig. 1.—Bolus of food removed from the esophagus. Impaction of the food mass in the constricted portion of the esophagus had formed a cast of its lumen.

something had gone wrong, he came to the hospital, accompanied by an older brother. On learning his complaint, he was asked to try to drink some water. After taking two or three swallows he promptly regurgitated it. On questioning him the fact was brought out that at four years of age he swallowed some lye, following which he was operated and fed for some time through "an opening made into his stomach." Later he received a series of dilators which he described as being pushed down his throat by the doctor.

On obtaining this history he was given a small amount of barium mixture and examined under the fluoroscope. The barium was noted to come to a complete stop at the level of Ludwig's angle or second rib anteriorly; none trickled beyond this point toward the stomach. An esophagoscopy was done according to the Jackson technique to investigate the character of the obstruction. A body suggesting the appearance of meat was noted in the line of vision through the esophagoscope after passing beyond the cricopharyngeus muscle down into the thoracic esophagus. Using Tucker's bead forceps the food mass was removed in one piece. Impaction of the food material in the constricted portion of the esophagus had formed a cast of its lumen, as shown in Figure 1. The food bolus appeared to consist principally of meat, probably some of the beef stew eaten the preceding evening. Shortly following the esophagoscopy he was allowed to drink a glass of milk, which he did without difficulty and with considerable satisfaction. Figure 2 was taken the day following the removal of the obstructing food bolus, and shows the site of the cicatricial stenosis where the bolus of food was lodged.

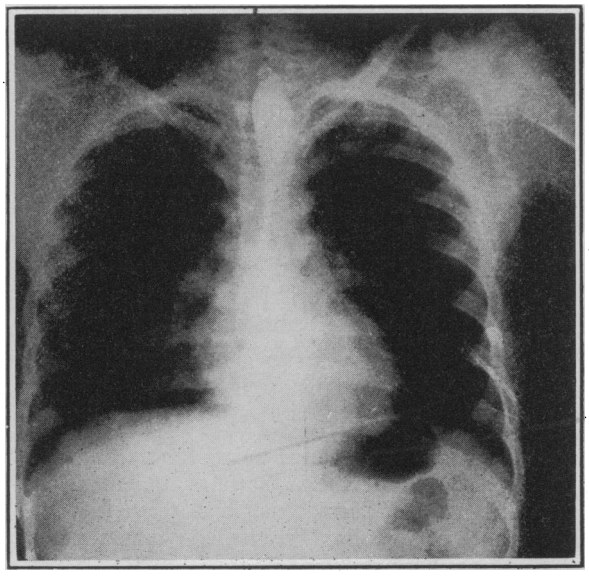

Fig. 2.—Film taken with barium mixture in esophagus, day following the removal of the bolus of food, shows site of stricture where food was lodged. Film by Doctor Hawarth.

Doctor Chevalier Jackson,[1] in his textbook on bronchoscopy and esophagoscopy, states, among other facts, that the accidental swallowing of lye is the most frequent cause of cicatricial stenosis of the esophagus. The location of these strictures, in the order of frequency, are at the crossing of the left bronchus, in the region of the cricopharyngeus muscle and at the hiatal level.

Blind methods of dilatation are extremely dangerous on account of the possibility of perforating the esophageal wall. Where the stenosis is of such extent as to interfere with the ingestion of the required amounts of liquid, gastrostomy should be done at once and the esophagoscopic treatment should be postponed until the water hunger is relieved. Esophagoscopic bouginage when no gastrostomy has been done has been proved in his hands the safest and most successful method of treatment.

Bouginage through the esophagoscope with gradually increasing sizes of bougies will be carried out at four to seven-day intervals in this case as recommended by Jackson.

Woodland Clinic.

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Ether Supply Watched Closely by Government Chemists.—The recent seizure of ether at Boston and Providence by the Food, Drug, and Insecticide Administration of the United States Department of Agriculture has brought from the department the statement that the sampling of ether on the market is carried on continuously and extensively by inspectors and chemists of the Food, Drug, and Insecticide Administration. Regulatory control of ether to prevent the use of the substandard product is faced with certain difficulties, say officials of the department charged with the enforcement of the Food and Drugs Act. The technique of the manufacture and packaging of ether has not yet been perfected to a point where there is absolute assurance that the ether meeting every requirement at the time of packaging will not upon standing deteriorate to a point where it will not meet the standard of the United States Pharmacopeia. Progress has been made in the development of manufacturing technique, but the problem has not been finally solved, the officials say. This situation necessitates very frequent and comprehensive inspection in order to prevent the consumption of substandard ether.

No one connected with the Department of Agriculture would permit himself to be quoted as saying that ether containing peroxids, which is the usual criterion of deterioration, would endanger the lives of patients on the operating table. It was said that there is a belief in certain quarters of the medical profession that such deteriorated ether is unsafe. However, the regulatory officials say it is not necessary for them to prove that such ether may be harmful to the patient before they can remove it from the market, because the Federal Food and Drugs Act sets up the specifications of the United States Pharmacopeia as its own standards of purity, and ether failing to meet those standards is in violation of the act if shipped within its jurisdiction. The officials state that for several years the utmost care has been maintained to safeguard the country's supply of anesthetic ether and that the seizures recently made in the New England cities are simply a few of the numerous detentions that have been made. Thousands of samples of ether have been tested in connection with this survey during the past year, and testing will be continued.—*United States Department of Agriculture.*